موجه إلى موجه IPSec (مفاتيح RSA) على نفق GRE مع مثال تكوين RIP

المحتويات

المقدمة

يقدم هذا المستند نموذجا لتكوين الموجهات التي تحتوي على مفاتيح RSA. يتم تكوين كلا الموجهين لمفاتيح RSA ونفق IPSec/تضمين التوجيه العام (GRE) باستخدام بروتوكول معلومات التوجيه (RIP).

المتطلبات الأساسية

المتطلبات

لا توجد متطلبات خاصة لهذا المستند.

المكونات المستخدمة

تستند المعلومات الواردة في هذا المستند إلى إصدارات البرامج والمكونات المادية التالية:

- موجه Cisco الذي يشغل برنامج Cisco IOS® الإصدار 12.2

تم إنشاء المعلومات الواردة في هذا المستند من الأجهزة الموجودة في بيئة معملية خاصة. بدأت جميع الأجهزة المُستخدمة في هذا المستند بتكوين ممسوح (افتراضي). إذا كانت شبكتك مباشرة، فتأكد من فهمك للتأثير المحتمل لأي أمر.

الاصطلاحات

للحصول على مزيد من المعلومات حول اصطلاحات المستندات، ارجع إلى اصطلاحات تلميحات Cisco التقنية.

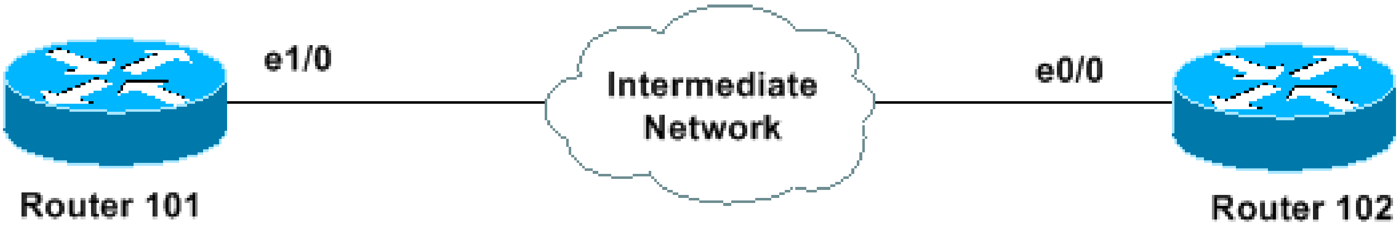
التكوين

في هذا القسم، تُقدّم لك معلومات تكوين الميزات الموضحة في هذا المستند.

ملاحظة: للعثور على معلومات إضافية حول الأوامر المستخدمة في هذا المستند، أستخدم أداة بحث الأوامر (للعملاء المسجلين فقط).

الرسم التخطيطي للشبكة

يستخدم هذا المستند إعداد الشبكة التالي:



التكوينات

يستخدم هذا المستند التكوينات التالية:

- تكوين التشفير للموجه 101
- الموجه 101
- تكوين التشفير للموجه 102
- الموجه 102

تكوين التشفير للموجه 101

```
                     config)#crypto isakmp enable)101
                config)#crypto isakmp identity hostname)101
                          config)#crypto isakmp policy 1)101
                   config-isakmp)#authentication rsa-encr)101
         config)#access-list 101 permit gre host 20.1.1.1)101
                                                 host 20.1.1.2
config)#crypto ipsec transform-set test esp-des esp-)101
                                                      sha-hmac
                           cfg-crypto-trans)#mode transport)101
                                config)#crypto map test 10 ip)101
                          config)#crypto map test 10 ipsec-is)101
NOTE: This new crypto map will remain disabled until a %
                                                          peer
   .and a valid access list have been configured
                      config-crypto-map)#set transform-set test)101
                          config-crypto-map)#match address 101)101
                          config-crypto-map)#set peer 20.1.1.2)101
                                           #(config-crypto-map)101

         config)#access-list 101 permit gre host 20.1.1.1)101
                                                 host 20.1.1.2
```

```
config)#interface Tunnel0)101
config-if)#crypto map test)101

config)#interface ethernet 1/0)101
config-if)#crypto map test)101
```

الموجه 101

```
...Building configuration

Current configuration : 1486 bytes
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 101
!
!
clock timezone PST -8
ip subnet-zero
ip domain name cisco.com
ip host 102.cisco.com 20.1.1.2
!
ip audit notify log
ip audit po max-events 100
!
crypto isakmp policy 1
authentication rsa-encr
crypto isakmp identity hostname
crypto isakmp keepalive 20 5
!
!
crypto ipsec transform-set test esp-des esp-sha-hmac
mode transport
!
crypto map test 10 ipsec-isakmp
set peer 20.1.1.2
set transform-set test
match address 101
!
!
crypto key pubkey-chain rsa
named-key 102.cisco.com
key-string
305C300D 06092A86 4886F70D 01010105 00034B00 30480241
00DB4FEB EF0C0D3D
72FC5BD3 29C8E94B 726161BC F1AF337C E5F2D11D FBFC2245
95EA2AB7 9D09156C
08A5A7CD 36E43D94 F1E3C978 37A79379 384D2A72 CE575E91
3F020301 0001
quit
!
!
!
interface Loopback1
ip address 192.168.1.1 255.255.255.0
!
interface Tunnel0
ip address 10.10.10.1 255.255.255.252
ip mtu 1420
tunnel source Ethernet1/0
tunnel destination 20.1.1.2
crypto map test
!
interface Ethernet0/0
ip address 1.1.1.1 255.255.255.0
!
interface Ethernet1/0
ip address 20.1.1.1 255.255.255.0
crypto map test
!
interface Serial2/0
no ip address
shutdown
!
interface Serial3/0
no ip address
shutdown
!
router rip
version 2
passive-interface Ethernet1/0
network 10.0.0.0
network 192.168.1.0
!
ip classless
no ip http server
!
!
access-list 101 permit gre host 20.1.1.1 host 20.1.1.2
!
!
line con 0
line aux 0
line vty 0 4
login
!
end

101#
```

تكوين التشفير للموجه 102

```
config)#crypto isakmp enable)102
config)#crypto isakmp identity hostname)102
config)#crypto isakmp policy 1)102
config-isakmp)#authentication rsa-encr)102
config)#access-list 101 permit gre host 20.1.1.2)102
host 20.1.1.1
config)#crypto ipsec transform-set test esp-des esp-)102
sha-hmac
cfg-crypto-trans)#mode transport)102
config)#crypto map test 10 ip)102
config)#crypto map test 10 ipsec-is)102
NOTE: This new crypto map will remain disabled until a %
peer
.and a valid access list have been configured
config-crypto-map)#set transform-set test)102
config-crypto-map)#match address 101)102
config-crypto-map)#set peer 20.1.1.1)102
#(config-crypto-map)102
```

```
config)#interface Tunnel0)102
config-if)#crypto map test)102

config)#interface ethernet 1/0)102
config-if)#crypto map test)102
```

الموجه 102

```
102#write terminal
...Building configuration

Current configuration : 1484 bytes
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 102
!
!
clock timezone PST -8
ip subnet-zero
ip domain name cisco.com
ip host 101.cisco.com 20.1.1.1
!
ip audit notify log
ip audit po max-events 100
!
crypto isakmp policy 1
 authentication rsa-encr
crypto isakmp identity hostname
crypto isakmp keepalive 20 5
!
!
crypto ipsec transform-set test esp-des esp-sha-hmac
 mode transport
!
crypto map test 10 ipsec-isakmp
 set peer 20.1.1.1
 set transform-set test
 match address 101
!
!
crypto key pubkey-chain rsa
 named-key 101.cisco.com
  address 20.1.1.1
  key-string
305C300D 06092A86 4886F70D 01010105 00034B00 30480241
00A7D24F E6E15787
5EE1434A A76A3DC1 ADE96A4D C6B4D0F3 A7DDAD10 446EF83A
89D1115F 0C517118
ECAF418E F4C84823 2A017B97 F85690EF EBCF3414 AB3E81F6
A5020301 0001
  quit
 !
 !
 !
interface Loopback1
 ip address 172.16.1.1 255.255.255.0
!
interface Tunnel0
 ip address 10.10.10.2 255.255.255.252
 ip mtu 1420
 tunnel source Ethernet0/0
 tunnel destination 20.1.1.1
 crypto map test
!
interface Ethernet0/0
 ip address 20.1.1.2 255.255.255.0
 crypto map test
!
interface Ethernet1/0
 no ip address
!
interface Serial2/0
 no ip address
 shutdown
!
interface Serial3/0
 no ip address
 shutdown
!
router rip
 version 2
 passive-interface Ethernet0/0
 network 10.0.0.0
 network 172.16.0.0
!
ip classless
no ip http server
!
!
access-list 101 permit gre host 20.1.1.2 host 20.1.1.1
!
!
line con 0
line aux 0
line vty 0 4
 login
!
end

102#
```

التحقق من الصحة

يوفر هذا القسم معلومات يمكنك إستخدامها للتأكد من أن التكوين يعمل بشكل صحيح.

يتم دعم بعض أوامر **العرض بواسطة** أداة مترجم الإخراج (العملاء المسجلون فقط)، والتي تتيح لك عرض تحليل إخراج أمر **العرض**.

- **show crypto isakmp sa detail**— يعرض جميع اقترانات أمان تبادل مفتاح الإنترنت (IKE) الحالية (SAs) في نظير.
- **show crypto ipSec**—يعرض الإعدادات المستخدمة من قبل SAs الحالية.
- **show crypto engine connections active**— يعرض ملخصا لمعلومات التكوين لمحركات التشفير.
- **show ip route**— يعرض الحالة الحالية لجدول التوجيه.

إخراج الأمر Router 101

```
                                               101#show crypto isakmp sa detail
                    Dec 28 21:15:19.371: ISAKMP (0:14): purging node 543282640*
                     Codes: C - IKE configuration mode, D - Dead Peer Detection
                                       K - Keepalives, N - NAT-traversal
                                         X - IKE Extended Authentication
                               psk - Preshared key, rsig - RSA signature
                                                   renc - RSA encryption

Conn id Local           Remote          Encr Hash Auth DH Lifetime Capabilities
           des  sha  rsig 1  23:59:06 D        20.1.1.2        20.1.1.1      14



                                                       101#show crypto ipsec sa

                                                         interface: Ethernet1/0
                                 Crypto map tag: test, local addr. 20.1.1.1

         (local  ident (addr/mask/prot/port): (20.1.1.1/255.255.255.255/47/0
         (remote ident (addr/mask/prot/port): (20.1.1.2/255.255.255.255/47/0
                                                  current_peer: 20.1.1.2:500
                                            {,PERMIT, flags={origin_is_acl
                          pkts encaps: 0, #pkts encrypt: 0, #pkts digest 0#
                          pkts decaps: 0, #pkts decrypt: 0, #pkts verify 0#
                                 pkts compressed: 0, #pkts decompressed: 0#
                            pkts not compressed: 0, #pkts compr. failed: 0#
                      pkts not decompressed: 0, #pkts decompress failed: 0#
                                             send errors 1, #recv errors 0#

             local crypto endpt.: 20.1.1.1, remote crypto endpt.: 20.1.1.2
                                             path mtu 1420, media mtu 1420
                                            current outbound spi: 7FB7A347

                                                          :inbound esp sas
                                              (spi: 0x7221D7D2(1914820562
                                      , transform: esp-des esp-sha-hmac
                                         { ,in use settings ={Transport
                   slot: 0, conn id: 2000, flow_id: 1, crypto map: test
              (sa timing: remaining key lifetime (k/sec): (4468975/3586
                                                       IV size: 8 bytes
                                            replay detection support: Y

                                                           :inbound ah sas

                                                          :inbound pcp sas

                                                         :outbound esp sas
                                              (spi: 0x7FB7A347(2142741319
                                      , transform: esp-des esp-sha-hmac
                                         { ,in use settings ={Transport
                   slot: 0, conn id: 2001, flow_id: 2, crypto map: test
              (sa timing: remaining key lifetime (k/sec): (4468975/3586
                                                       IV size: 8 bytes
                                            replay detection support: Y

                                                          :outbound ah sas

                                                         :outbound pcp sas


                                                             interface: Tunnel0
                                 Crypto map tag: test, local addr. 20.1.1.1
```

```
          (local  ident (addr/mask/prot/port): (20.1.1.1/255.255.255.255/47/0
          (remote ident (addr/mask/prot/port): (20.1.1.2/255.255.255.255/47/0
                                                   current_peer: 20.1.1.2:500
                                             {,PERMIT, flags={origin_is_acl
                           pkts encaps: 0, #pkts encrypt: 0, #pkts digest 0#
                           pkts decaps: 0, #pkts decrypt: 0, #pkts verify 0#
                                  pkts compressed: 0, #pkts decompressed: 0#
                             pkts not compressed: 0, #pkts compr. failed: 0#
                       pkts not decompressed: 0, #pkts decompress failed: 0#
                                              send errors 1, #recv errors 0#

              local crypto endpt.: 20.1.1.1, remote crypto endpt.: 20.1.1.2
                                              path mtu 1420, media mtu 1420
                                             current outbound spi: 7FB7A347

                                                           :inbound esp sas
                                               (spi: 0x7221D7D2(1914820562
                                       , transform: esp-des esp-sha-hmac
                                          { ,in use settings ={Transport
                    slot: 0, conn id: 2000, flow_id: 1, crypto map: test
               (sa timing: remaining key lifetime (k/sec): (4468975/3585
                                                        IV size: 8 bytes
                                             replay detection support: Y

                                                            :inbound ah sas

                                                           :inbound pcp sas

                                                          :outbound esp sas
                                               (spi: 0x7FB7A347(2142741319
                                       , transform: esp-des esp-sha-hmac
                                          { ,in use settings ={Transport
                    slot: 0, conn id: 2001, flow_id: 2, crypto map: test
               (sa timing: remaining key lifetime (k/sec): (4468975/3584
                                                        IV size: 8 bytes
                                             replay detection support: Y

                                                           :outbound ah sas

                                                          :outbound pcp sas


                                       101#show crypto engine connections active

ID Interface         IP-Address      State  Algorithm          Encrypt  Decrypt
Ethernet1/0     20.1.1.1        set    HMAC_SHA+DES_56_CB      0        0 14
Ethernet1/0     20.1.1.1        set    HMAC_SHA+DES_56_CB      0        6 2000
Ethernet1/0     20.1.1.1        set    HMAC_SHA+DES_56_CB      5        0 2001




                                                               101#show ip route
                  Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
           D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
           N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
                     E1 - OSPF external type 1, E2 - OSPF external type 2
 i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
                candidate default, U - per-user static route, o - ODR - *
                                     P - periodic downloaded static route

                                               Gateway of last resort is not set

                                        is subnetted, 1 subnets 20.0.0.0/24
```

```
C       20.1.1.0 is directly connected, Ethernet1/0
R    172.16.0.0/16 [120/1] via 10.10.10.2, 00:00:08, Tunnel0
is subnetted, 1 subnets 10.0.0.0/30
C       10.10.10.0 is directly connected, Tunnel0
C    192.168.1.0/24 is directly connected, Loopback1
101#
```

إخراج الأمر Router 102

```
102#show crypto isakmp sa detail
Codes: C - IKE configuration mode, D - Dead Peer Detection
K - Keepalives, N - NAT-traversal
X - IKE Extended Authentication
psk - Preshared key, rsig - RSA signature
renc - RSA encryption

Conn id Local           Remote          Encr Hash Auth DH Lifetime Capabilities
des   sha  rsig 1  23:58:44 D        20.1.1.1        20.1.1.2      15


102#show crypto ipsec sa

interface: Ethernet0/0
Crypto map tag: test, local addr. 20.1.1.2

(local  ident (addr/mask/prot/port): (20.1.1.2/255.255.255.255/47/0
(remote ident (addr/mask/prot/port): (20.1.1.1/255.255.255.255/47/0
current_peer: 20.1.1.1:500
{,PERMIT, flags={origin_is_acl
pkts encaps: 4, #pkts encrypt: 4, #pkts digest 4#
pkts decaps: 3, #pkts decrypt: 3, #pkts verify 3#
pkts compressed: 0, #pkts decompressed: 0#
pkts not compressed: 0, #pkts compr. failed: 0#
pkts not decompressed: 0, #pkts decompress failed: 0#
send errors 0, #recv errors 0#

local crypto endpt.: 20.1.1.2, remote crypto endpt.: 20.1.1.1
path mtu 1420, media mtu 1420
current outbound spi: 92F52EF2

:inbound esp sas
(spi: 0x1D25013E(488964414
, transform: esp-des esp-sha-hmac
{ ,in use settings ={Transport
slot: 0, conn id: 2000, flow_id: 1, crypto map: test
(sa timing: remaining key lifetime (k/sec): (4596388/3494
IV size: 8 bytes
replay detection support: Y

:inbound ah sas

:inbound pcp sas

:outbound esp sas
(spi: 0x92F52EF2(2465541874
, transform: esp-des esp-sha-hmac
{ ,in use settings ={Transport
slot: 0, conn id: 2001, flow_id: 2, crypto map: test
(sa timing: remaining key lifetime (k/sec): (4596388/3494
IV size: 8 bytes
replay detection support: Y

:outbound ah sas
```

```
                                                          :outbound pcp sas


                                                              interface: Tunnel0
                                  Crypto map tag: test, local addr. 20.1.1.2

          (local  ident (addr/mask/prot/port): (20.1.1.2/255.255.255.255/47/0
          (remote ident (addr/mask/prot/port): (20.1.1.1/255.255.255.255/47/0
                                                   current_peer: 20.1.1.1:500
                                             {,PERMIT, flags={origin_is_acl
                           pkts encaps: 4, #pkts encrypt: 4, #pkts digest 4#
                           pkts decaps: 3, #pkts decrypt: 3, #pkts verify 3#
                                  pkts compressed: 0, #pkts decompressed: 0#
                             pkts not compressed: 0, #pkts compr. failed: 0#
                       pkts not decompressed: 0, #pkts decompress failed: 0#
                                              send errors 0, #recv errors 0#

              local crypto endpt.: 20.1.1.2, remote crypto endpt.: 20.1.1.1
                                              path mtu 1420, media mtu 1420
                                             current outbound spi: 92F52EF2

                                                           :inbound esp sas
                                                (spi: 0x1D25013E(488964414
                                       , transform: esp-des esp-sha-hmac
                                          { ,in use settings ={Transport
                    slot: 0, conn id: 2000, flow_id: 1, crypto map: test
               (sa timing: remaining key lifetime (k/sec): (4596388/3493
                                                        IV size: 8 bytes
                                             replay detection support: Y

                                                            :inbound ah sas

                                                           :inbound pcp sas

                                                          :outbound esp sas
                                               (spi: 0x92F52EF2(2465541874
                                       , transform: esp-des esp-sha-hmac
                                          { ,in use settings ={Transport
                    slot: 0, conn id: 2001, flow_id: 2, crypto map: test
               (sa timing: remaining key lifetime (k/sec): (4596388/3493
                                                        IV size: 8 bytes
                                             replay detection support: Y

                                                           :outbound ah sas

                                                          :outbound pcp sas




                                       102#show crypto engine connections active

ID Interface       IP-Address      State  Algorithm          Encrypt  Decrypt
Ethernet0/0     20.1.1.2        set    HMAC_SHA+DES_56_CB       0        0 15
Ethernet0/0     20.1.1.2        set    HMAC_SHA+DES_56_CB       0        3 2000
Ethernet0/0     20.1.1.2        set    HMAC_SHA+DES_56_CB       4        0 2001

                                                                            102#
                                                               102#show ip route
                  Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
           D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
           N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
                     E1 - OSPF external type 1, E2 - OSPF external type 2
```

```
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
              candidate default, U - per-user static route, o - ODR - *
                                    P - periodic downloaded static route

                                          Gateway of last resort is not set

                               is subnetted, 1 subnets 20.0.0.0/24
                   C      20.1.1.0 is directly connected, Ethernet0/0
                            is subnetted, 1 subnets 172.16.0.0/24
                   C      172.16.1.0 is directly connected, Loopback1
                               is subnetted, 1 subnets 10.0.0.0/30
                     C      10.10.10.0 is directly connected, Tunnel0
          R    192.168.1.0/24 [120/1] via 10.10.10.1, 00:00:08, Tunnel0
```

استكشاف الأخطاء وإصلاحها

يوفر هذا القسم معلومات يمكنك استخدامها لاستكشاف أخطاء التكوين وإصلاحها. للحصول على معلومات إضافية حول أستكشاف الأخطاء وإصلاحها، الرجاء مراجعة أستكشاف أخطاء أمان IP وإصلاحها - فهم أوامر تصحيح الأخطاء واستخدامها.

إجراء استكشاف الأخطاء وإصلاحها

اتبع هذه التعليمات لاستكشاف أخطاء عملية التكوين لديك وإصلاحها.

1. قم بإنشاء مفاتيح RSA على الموجه 101.

```
                              101#show crypto key mypubkey rsa
                                                          101#
                                                          101#
                                                    101#conf t
                           config)#ip domain-name cisco.com)101
                          ? config)#crypto key generate rsa)101
  general-keys   Generate a general purpose RSA key pair for signing and
                                                        encryption
usage-keys    Generate seperate RSA key pairs for signing and encryption


                             config)#crypto key generate rsa)101
                         The name for the keys will be: 101.cisco.com
  Choose the size of the key modulus in the range of 360 to 2048 for your
 General Purpose Keys. Choosing a key modulus greater than 512 may take
                                                     .a few minutes

                              :[How many bits in the modulus [512
                             [Generating 512 bit RSA keys ...[OK %

                              101#show crypto key mypubkey rsa
                Key pair was generated at: 12:02:08 PST Dec 28 2002 %
                                           Key name: 101.cisco.com
                                        Usage: General Purpose Key
                                                         :Key Data
 305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00A7D24F E6E15787
 5EE1434A A76A3DC1 ADE96A4D C6B4D0F3 A7DDAD10 446EF83A 89D1115F 0C517118
     ECAF418E F4C84823 2A017B97 F85690EF EBCF3414 AB3E81F6 A5020301 0001
                Key pair was generated at: 12:02:12 PST Dec 28 2002 %
                                     Key name: 101.cisco.com.server
                                             Usage: Encryption Key
                                                         :Key Data
 307C300D 06092A86 4886F70D 01010105 00036B00 30680261 00B2092A 86483641
 EB09900B BA0CD88A BE915C5E 05C1496B 70093D8B BC277A88 0E256BBE 4DB7EF92
 8FE93C61 710309A3 451DAB72 93F35CD0 1CAD15AC B904B2B4 73B7A9F5 65A79E66
     8D145427 F06DD89C 862B88BB 4C671508 AB3443BB 6270388C A7020301 0001
```

```
101#
```

2. قم بإنشاء مفاتيح RSA على الموجه 102.

```
102#configure terminal
.Enter configuration commands, one per line.  End with CNTL/Z
config)#ip domain-name cisco.com)102
config)#crypto key gen rsa)102
The name for the keys will be: 102.cisco.com
Choose the size of the key modulus in the range of 360 to 2048 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
.a few minutes

:[How many bits in the modulus [512
[Generating 512 bit RSA keys ...[OK %


102#show crypto key mypubkey rsa
Key pair was generated at: 12:03:45 PST Dec 28 2002 %
Key name: 102.cisco.com
Usage: General Purpose Key
:Key Data
305C300D 06092A86 4886F70D 01010105 00034B00 30480241 00DB4FEB EF0C0D3D
72FC5BD3 29C8E94B 726161BC F1AF337C E5F2D11D FBFC2245 95EA2AB7 9D09156C
    08A5A7CD 36E43D94 F1E3C978 37A79379 384D2A72 CE575E91 3F020301 0001
Key pair was generated at: 12:03:48 PST Dec 28 2002 %
Key name: 102.cisco.com.server
Usage: Encryption Key
:Key Data
307C300D 06092A86 4886F70D 01010105 00036B00 30680261 00BFD36E A1642BFC
77C88F89 8A260840 213E122E E1AF1E24 AF39B984 DACA06BC C303AD77 95BB6B6C
89CC6D13 B16CC4E3 45C101E4 61A13924 5559891A AB59B40D 826A5066 231B48D6
    AEB2B367 94F6C492 016F8778 74B368A2 BFD1424D 79C63C94 5F020301 0001
102#
```

3. قم بحل اسم المضيف.

```
config)#ip host 101.cisco.com  20.1.1.1)102
```

4. قم بتبادل مفاتيح الأغراض العامة على الموجه 101.

```
config)#crypto key pubkey-chain rsa)101
config-pubkey-chain)#named-key 102.cisco.com)101
Named public key resolved to ip address: 20.1.1.2 %
? config-pubkey-key)#key-string)101
.... Enter a public key as a hexidecimal number


config-pubkey)#$6F70D 01010105 00034B00 30480241 00DB4FEB EF0C0D3D)101
config-pubkey)#$26161BC F1AF337C E5F2D11D FBFC2245 95EA2AB7 9D09156C)101
config-pubkey)#$1E3C978 37A79379 384D2A72 CE575E91 3F020301 0001)101
config-pubkey)#quit)101
config-pubkey-key)#exit)101
```

5. قم بتبادل مفاتيح الأغراض العامة على الموجه 102.

```
config)#crypto key pubkey-chain rsa)102
config-pubkey-chain)#named-key 101.cisco.com)102
Named public key resolved to ip address: 20.1.1.1 %
config-pubkey-key)#key-string)102
.... Enter a public key as a hexidecimal number

config-pubkey)#$6F70D 01010105 00034B00 30480241 00A7D24F E6E15787)102
config-pubkey)#$DE96A4D C6B4D0F3 A7DDAD10 446EF83A 89D1115F 0C517118)102
config-pubkey)#$A017B97 F85690EF EBCF3414 AB3E81F6 A5020301 0001)102
config-pubkey)#quit)102
config-pubkey-key)#exit)102
config-pubkey-chain)#exit)102
```

```
config)#exit)102
```

أوامر استكشاف الأخطاء وإصلاحها

يتم دعم بعض أوامر **العرض بواسطة** أداة مترجم الإخراج (العملاء المسجلون فقط)، والتي تتيح لك عرض تحليل إخراج أمر **العرض**.

ملاحظة: قبل إصدار أوامر **تصحيح الأخطاء**، راجع المعلومات المهمة في أوامر تصحيح الأخطاء.

تصحيح أخطاء الموجه 101:

```
                                                                                        101#
                                                                                        101#
                                                                                        101#
                                                                                        101#
                                                 , :(Dec 28 21:14:27.011: IPSEC(sa_request*
                              ,key eng. msg.) OUTBOUND local= 20.1.1.1, remote= 20.1.1.2)
                                   ,(local_proxy= 20.1.1.1/255.255.255.255/47/0 (type=1
                                  ,(remote_proxy= 20.1.1.2/255.255.255.255/47/0 (type=1
                                       , protocol= ESP, transform= esp-des esp-sha-hmac
                                                           ,lifedur= 3600s and 4608000kb
                    spi= 0xA12DDC39(2704137273), conn_id= 0, keysize= 0, flags= 0x400C
                                    (Dec 28 21:14:27.051: ISAKMP: received ke message (1/1*
                              Dec 28 21:14:27.051: ISAKMP: local port 500, remote port 500*
                                    Dec 28 21:14:27.099: ISAKMP: set new node 0 to QM_IDLE*
                        Dec 28 21:14:27.099: ISAKMP (0:14): constructed NAT-T vendor-03 ID*
                        Dec 28 21:14:27.099: ISAKMP (0:14): constructed NAT-T vendor-02 ID*
           Dec 28 21:14:27.099: ISAKMP (0:14): Input = IKE_MESG_FROM_IPSEC, IKE_SA_REQ_MM*
         Dec 28 21:14:27.099: ISAKMP (0:14): Old State = IKE_READY  New State = IKE_I_MM1*

                          Dec 28 21:14:27.099: ISAKMP (0:14): beginning Main Mode exchange*
                   Dec 28 21:14:27.099: ISAKMP (0:14): sending packet to 20.1.1.2 my_port*
                                                         peer_port 500 (I) MM_NO_STATE 500 
                  Dec 28 21:14:27.343: ISAKMP (0:14): received packet from 20.1.1.2 dport*
                                                              sport 500 (I) MM_NO_STATE 500 
              Dec 28 21:14:27.343: ISAKMP (0:14): Input = IKE_MESG_FROM_PEER, IKE_MM_EXCH*
         Dec 28 21:14:27.343: ISAKMP (0:14): Old State = IKE_I_MM1  New State = IKE_I_MM2*

                Dec 28 21:14:27.411: ISAKMP (0:14): processing SA payload. message ID = 0*
                          Dec 28 21:14:27.411: ISAKMP (0:14): processing vendor id payload*
              Dec 28 21:14:27.411: ISAKMP (0:14): vendor ID seems Unity/DPD but bad major*
                                    Dec 28 21:14:27.411: ISAKMP (0:14): vendor ID is NAT-T*
Dec 28 21:14:27.411: ISAKMP (0:14): Checking ISAKMP transform 1 against priority 1 policy*
                                      Dec 28 21:14:27.411: ISAKMP:      encryption DES-CBC*
                                                Dec 28 21:14:27.411: ISAKMP:      hash SHA*
                                         Dec 28 21:14:27.411: ISAKMP:      default group 1*
                                            Dec 28 21:14:27.411: ISAKMP:      auth RSA sig*
                                    Dec 28 21:14:27.411: ISAKMP:      life type in seconds*
              Dec 28 21:14:27.411: ISAKMP:      life duration (VPI) of  0x0 0x1 0x51 0x80*
               Dec 28 21:14:27.411: ISAKMP (0:14): Authentication method offered does not*
                                                                             !match policy 
           Dec 28 21:14:27.411: ISAKMP (0:14): atts are not acceptable. Next payload is 0*
                  Dec 28 21:14:27.411: ISAKMP (0:14): Checking ISAKMP transform 1 against*
                                                                     priority 65535 policy 
                                      Dec 28 21:14:27.411: ISAKMP:      encryption DES-CBC*
                                                Dec 28 21:14:27.411: ISAKMP:      hash SHA*
                                         Dec 28 21:14:27.411: ISAKMP:      default group 1*
                                            Dec 28 21:14:27.411: ISAKMP:      auth RSA sig*
                                    Dec 28 21:14:27.411: ISAKMP:      life type in seconds*
              Dec 28 21:14:27.411: ISAKMP:      life duration (VPI) of  0x0 0x1 0x51 0x80*
Dec 28 21:14:27.411: ISAKMP (0:14): atts are acceptable. Next payload is 0*
Dec 28 21:14:27.411: ISAKMP (0:14): processing vendor id payload*
Dec 28 21:14:27.411: ISAKMP (0:14): vendor ID seems Unity/DPD but bad major*
Dec 28 21:14:27.411: ISAKMP (0:14): vendor ID is NAT-T*
,Dec 28 21:14:27.411: ISAKMP (0:14): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_MAIN_MODE
Dec 28 21:14:27.411: ISAKMP (0:14): Old State = IKE_I_MM2*
New State = IKE_I_MM2

Dec 28 21:14:27.503: ISAKMP (0:14): constructed HIS NAT-D*
Dec 28 21:14:27.503: ISAKMP (0:14): constructed MINE NAT-D*
Dec 28 21:14:27.503: ISAKMP (0:14): sending packet to 20.1.1.2 my_port*
peer_port 500 (I) MM_SA_SETUP 500
,Dec 28 21:14:27.503: ISAKMP (0:14): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_COMPLETE
Dec 28 21:14:27.503: ISAKMP (0:14): Old State = IKE_I_MM2  New State = IKE_I_MM3*

Dec 28 21:14:27.763: ISAKMP (0:14): received packet from 20.1.1.2 dport*
sport 500 (I) MM_SA_SETUP 500
Dec 28 21:14:27.763: ISAKMP (0:14): Input = IKE_MESG_FROM_PEER, IKE_MM_EXCH*
Dec 28 21:14:27.763: ISAKMP (0:14): Old State = IKE_I_MM3  New State = IKE_I_MM4*

Dec 28 21:14:27.811: ISAKMP (0:14): processing KE payload. message ID = 0*
Dec 28 21:14:27.811: ISAKMP (0:14): processing NONCE payload. message ID = 0*
Dec 28 21:14:27.811: ISAKMP (0:14): SKEYID state generated*
Dec 28 21:14:27.811: ISAKMP (0:14): processing vendor id payload*
Dec 28 21:14:27.811: ISAKMP (0:14): vendor ID is Unity*
Dec 28 21:14:27.811: ISAKMP (0:14): vendor ID is NAT-T*
Dec 28 21:14:27.811: ISAKMP (0:14): processing vendor id payload*
Dec 28 21:14:27.811: ISAKMP (0:14): vendor ID is DPD*
Dec 28 21:14:27.811: ISAKMP (0:14): vendor ID is NAT-T*
Dec 28 21:14:27.811: ISAKMP (0:14): processing vendor id payload*
!Dec 28 21:14:27.811: ISAKMP (0:14): speaking to another IOS box*
Dec 28 21:14:27.811: ISAKMP:received payload type 17*
Dec 28 21:14:27.811: ISAKMP (0:14): Detected NAT-D payload*
Dec 28 21:14:27.811: ISAKMP (0:14): NAT match MINE hash*
Dec 28 21:14:27.811: ISAKMP:received payload type 17*
Dec 28 21:14:27.811: ISAKMP (0:14): Detected NAT-D payload*
Dec 28 21:14:27.811: ISAKMP (0:14): NAT match HIS hash*
,Dec 28 21:14:27.811: ISAKMP (0:14): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_MAIN_MODE
Dec 28 21:14:27.811: ISAKMP (0:14): Old State = IKE_I_MM4*
New State = IKE_I_MM4

Dec 28 21:14:27.903: ISAKMP (0:14): Send initial contact*
Dec 28 21:14:27.903: ISAKMP (0:14): SA is doing RSA signature*
authentication using id type ID_FQDN
Dec 28 21:14:27.903: ISAKMP (14): ID payload*
          next-payload : 9
          type         : 2
FQDN name    : 101.cisco.com
         protocol     : 17
          port         : 0
         length       : 17
Dec 28 21:14:27.903: ISAKMP (14): Total payload length: 21*
Dec 28 21:14:27.903: ISAKMP (0:14): using the default keypair to sign*
Dec 28 21:14:28.003: ISAKMP (0:14): sending packet to 20.1.1.2*
my_port 500 peer_port 500 (I) MM_KEY_EXCH
,Dec 28 21:14:28.003: ISAKMP (0:14): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_COMPLETE
Dec 28 21:14:28.003: ISAKMP (0:14): Old State = IKE_I_MM4  New State = IKE_I_MM5*

Dec 28 21:14:28.435: ISAKMP (0:14): received packet from 20.1.1.2 dport*
sport 500 (I) MM_KEY_EXCH 500
```

```
Dec 28 21:14:28.435: ISAKMP (0:14): Input = IKE_MESG_FROM_PEER, IKE_MM_EXCH*
Dec 28 21:14:28.435: ISAKMP (0:14): Old State = IKE_I_MM5  New State = IKE_I_MM6*

Dec 28 21:14:28.435: ISAKMP (0:14): received packet from 20.1.1.2 dport*
sport 500 (I) MM_KEY_EXCH 500
Dec 28 21:14:28.435: ISAKMP: set new node 226463539 to QM_IDLE*
,Dec 28 21:14:28.435: ISAKMP (0:14): Unknown Input: state = IKE_I_MM6*
major, minor = IKE_MESG_FROM_PEER, IKE_INFO_DELETE

Dec 28 21:14:28.435: %CRYPTO-6-IKMP_MODE_FAILURE: Processing of*
Informational mode failed with peer at 20.1.1.2
Dec 28 21:14:28.503: ISAKMP (0:14): processing ID payload. message ID = 0*
Dec 28 21:14:28.503: ISAKMP (14): Process ID payload*
type         : 2
FQDN name    : 102.cisco.com
protocol     : 17
port         : 0
length       : 13
Dec 28 21:14:28.503: ISAKMP (0:14): processing SIG payload. message ID = 0*
= Dec 28 21:14:28.503: ISAKMP (14): sa->peer.name = , sa->peer_id.id.id_fqdn.fqdn*
cisco.com.102
Dec 28 21:14:28.551: ISAKMP (0:14): SA has been authenticated with 20.1.1.2*
Dec 28 21:14:28.551: ISAKMP (0:14): IKE_DPD is enabled, initializing timers*
Dec 28 21:14:28.551: ISAKMP: Locking peer struct 0x18E6620, IKE refcount 2*
for from crypto_ikmp_dpd_ike_init
,Dec 28 21:14:28.551: ISAKMP (0:14): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_MAIN_MODE
Dec 28 21:14:28.551: ISAKMP (0:14): Old State = IKE_I_MM6  New State = IKE_I_MM6*

Dec 28 21:14:28.551: ISAKMP (0:14): received packet from 20.1.1.2 dport 500 sport*
I) MM_KEY_EXCH) 500
Dec 28 21:14:28.551: ISAKMP: set new node 2089493550 to QM_IDLE*
,Dec 28 21:14:28.551: ISAKMP (0:14): Unknown Input: state = IKE_I_MM6, major*
minor = IKE_MESG_FROM_PEER, IKE_INFO_DELETE

,Dec 28 21:14:28.611: ISAKMP (0:14): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_COMPLETE
Dec 28 21:14:28.611: ISAKMP (0:14): Old State = IKE_I_MM6*
New State = IKE_P1_COMPLETE

,Dec 28 21:14:28.651: ISAKMP (0:14): beginning Quick Mode exchange*
M-ID of 543282640
Dec 28 21:14:28.683: ISAKMP (0:14): sending packet to 20.1.1.2*
my_port 500 peer_port 500 (I) QM_IDLE
,Dec 28 21:14:28.683: ISAKMP (0:14): Node 543282640, Input = IKE_MESG_INTERNAL*
IKE_INIT_QM
Dec 28 21:14:28.683: ISAKMP (0:14): Old State = IKE_QM_READY*
New State = IKE_QM_I_QM1
,Dec 28 21:14:28.683: ISAKMP (0:14): Input = IKE_MESG_INTERNAL*
IKE_PHASE1_COMPLETE
Dec 28 21:14:28.683: ISAKMP (0:14): Old State = IKE_P1_COMPLETE*
New State = IKE_P1_COMPLETE

Dec 28 21:14:29.303: ISAKMP (0:14): received packet from 20.1.1.2*
dport 500 sport 500 (I) QM_IDLE
Dec 28 21:14:29.303: ISAKMP (0:14): processing HASH payload. message*
ID = 543282640
Dec 28 21:14:29.303: ISAKMP (0:14): processing SA payload. message*
ID = 543282640
Dec 28 21:14:29.303: ISAKMP (0:14): Checking IPSec proposal 1*
Dec 28 21:14:29.303: ISAKMP: transform 1, ESP_DES*
:Dec 28 21:14:29.303: ISAKMP:   attributes in transform*
Dec 28 21:14:29.303: ISAKMP:      encaps is 2*
Dec 28 21:14:29.303: ISAKMP:      SA life type in seconds*
```

```
               Dec 28 21:14:29.303: ISAKMP:      SA life duration (basic) of 3600*
                      Dec 28 21:14:29.303: ISAKMP:      SA life type in kilobytes*
   Dec 28 21:14:29.303: ISAKMP:      SA life duration (VPI) of  0x0 0x46 0x50 0x0*
                      Dec 28 21:14:29.303: ISAKMP:      authenticator is HMAC-SHA*
                         .Dec 28 21:14:29.303: ISAKMP (0:14): atts are acceptable*
         ,Dec 28 21:14:29.303: IPSEC(validate_proposal_request): proposal part #1*
                      ,key eng. msg.) INBOUND local= 20.1.1.1, remote= 20.1.1.2)
                          ,(local_proxy= 20.1.1.1/255.255.255.255/47/0 (type=1
                         ,(remote_proxy= 20.1.1.2/255.255.255.255/47/0 (type=1
                              , protocol= ESP, transform= esp-des esp-sha-hmac
                                                          ,lifedur= 0s and 0kb
                               spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x4
                    .Dec 28 21:14:29.303: ISAKMP (0:14): processing NONCE payload*
                                                           message ID = 543282640
Dec 28 21:14:29.303: ISAKMP (0:14): processing ID payload. message ID = 543282640*
Dec 28 21:14:29.303: ISAKMP (0:14): processing ID payload. message ID = 543282640*
     Dec 28 21:14:29.351: ISAKMP: Locking peer struct 0x18E6620, IPSEC refcount 1*
                                                                 for for stuff_ke
                           Dec 28 21:14:29.351: ISAKMP (0:14): Creating IPSec SAs*
                Dec 28 21:14:29.351:         inbound SA from 20.1.1.2 to 20.1.1.1*
                                              (proxy 20.1.1.2 to 20.1.1.1)
     Dec 28 21:14:29.351:         has spi 0xA12DDC39 and conn_id 2000 and flags 4*
                            Dec 28 21:14:29.351:         lifetime of 3600 seconds*
                       Dec 28 21:14:29.351:         lifetime of 4608000 kilobytes*
                                Dec 28 21:14:29.351:         has client flags 0x0*
                           Dec 28 21:14:29.351:         outbound SA from 20.1.1.1*
                          (       to 20.1.1.2  (proxy 20.1.1.1        to  20.1.1.2
     Dec 28 21:14:29.351:         has spi -437189881 and conn_id 2001 and flags C*
                            Dec 28 21:14:29.351:         lifetime of 3600 seconds*
                       Dec 28 21:14:29.351:         lifetime of 4608000 kilobytes*
                                Dec 28 21:14:29.351:         has client flags 0x0*
           Dec 28 21:14:29.351: ISAKMP (0:14): sending packet to 20.1.1.2 my_port*
                                                    peer_port 500 (I) QM_IDLE 500
                Dec 28 21:14:29.351: ISAKMP (0:14): deleting node 543282640 error*
                                                                  "" FALSE reason
  ,Dec 28 21:14:29.351: ISAKMP (0:14): Node 543282640, Input = IKE_MESG_FROM_PEER*
                                                                      IKE_QM_EXCH
                     Dec 28 21:14:29.351: ISAKMP (0:14): Old State = IKE_QM_I_QM1*
                                               New State = IKE_QM_PHASE2_COMPLETE
                     ...Dec 28 21:14:29.371: IPSEC(key_engine): got a queue event*
                                    , :(Dec 28 21:14:29.371: IPSEC(initialize_sas*
                      ,key eng. msg.) INBOUND local= 20.1.1.1, remote= 20.1.1.2)
                                  ,(local_proxy= 20.1.1.1/0.0.0.0/47/0 (type=1
                                 ,(remote_proxy= 20.1.1.2/0.0.0.0/47/0 (type=1
                              , protocol= ESP, transform= esp-des esp-sha-hmac
                                                 ,lifedur= 3600s and 4608000kb
            spi= 0xA12DDC39(2704137273), conn_id= 2000, keysize= 0, flags= 0x4
                                    , :(Dec 28 21:14:29.371: IPSEC(initialize_sas*
                     ,key eng. msg.) OUTBOUND local= 20.1.1.1, remote= 20.1.1.2)
                                  ,(local_proxy= 20.1.1.1/0.0.0.0/47/0 (type=1
                                 ,(remote_proxy= 20.1.1.2/0.0.0.0/47/0 (type=1
                              , protocol= ESP, transform= esp-des esp-sha-hmac
                                                 ,lifedur= 3600s and 4608000kb
            spi= 0xE5F10307(3857777415), conn_id= 2001, keysize= 0, flags= 0xC
  Dec 28 21:14:29.371: IPSEC(add mtree): src 20.1.1.1, dest 20.1.1.2, dest_port 0*

                               ,Dec 28 21:14:29.371: IPSEC(create_sa): sa created*
                                            ,sa) sa_dest= 20.1.1.1, sa_prot= 50)
                                               ,(sa_spi= 0xA12DDC39(2704137273
                             sa_trans= esp-des esp-sha-hmac , sa_conn_id= 2000
                               ,Dec 28 21:14:29.371: IPSEC(create_sa): sa created*
                                            ,sa) sa_dest= 20.1.1.2, sa_prot= 50)
                                               ,(sa_spi= 0xE5F10307(3857777415
                             sa_trans= esp-des esp-sha-hmac , sa_conn_id= 2001
```

تصحيح أخطاء الموجه 102:

```
102#
Dec 28 21:18:12.111: ISAKMP (0:0): received packet from 20.1.1.1*
dport 500 sport 500 (N) NEW SA
Dec 28 21:18:12.111: ISAKMP: local port 500, remote port 500*
Dec 28 21:18:12.147: ISAKMP (0:15): Input = IKE_MESG_FROM_PEER, IKE_MM_EXCH*
Dec 28 21:18:12.147: ISAKMP (0:15): Old State = IKE_READY  New State = IKE_R_MM1*

Dec 28 21:18:12.187: ISAKMP (0:15): processing SA payload. message ID = 0*
Dec 28 21:18:12.187: ISAKMP (0:15): processing vendor id payload*
Dec 28 21:18:12.187: ISAKMP (0:15): vendor ID seems Unity/DPD but bad major*
Dec 28 21:18:12.187: ISAKMP (0:15): vendor ID is NAT-T*
Dec 28 21:18:12.187: ISAKMP (0:15): processing vendor id payload*
Dec 28 21:18:12.187: ISAKMP (0:15): vendor ID seems Unity/DPD but bad major*
Dec 28 21:18:12.187: ISAKMP (0:15): vendor ID is NAT-T*
Dec 28 21:18:12.187: ISAKMP (0:15): Checking ISAKMP transform 1 against*
priority 1 policy
Dec 28 21:18:12.187: ISAKMP:      encryption DES-CBC*
Dec 28 21:18:12.187: ISAKMP:      hash SHA*
Dec 28 21:18:12.187: ISAKMP:      default group 1*
Dec 28 21:18:12.187: ISAKMP:      auth RSA sig*
Dec 28 21:18:12.187: ISAKMP:      life type in seconds*
Dec 28 21:18:12.187: ISAKMP:      life duration (VPI) of  0x0 0x1 0x51 0x80*
Dec 28 21:18:12.187: ISAKMP (0:15): Authentication method offered does not*
!match policy
Dec 28 21:18:12.187: ISAKMP (0:15): atts are not acceptable. Next payload is 0*
Dec 28 21:18:12.187: ISAKMP (0:15): Checking ISAKMP transform 1 against*
priority 65535 policy
Dec 28 21:18:12.187: ISAKMP:      encryption DES-CBC*
Dec 28 21:18:12.187: ISAKMP:      hash SHA*
Dec 28 21:18:12.187: ISAKMP:      default group 1*
Dec 28 21:18:12.187: ISAKMP:      auth RSA sig*
Dec 28 21:18:12.187: ISAKMP:      life type in seconds*
Dec 28 21:18:12.187: ISAKMP:      life duration (VPI) of  0x0 0x1 0x51 0x80*
Dec 28 21:18:12.187: ISAKMP (0:15): atts are acceptable. Next payload is 0*
Dec 28 21:18:12.187: ISAKMP (0:15): processing vendor id payload*
Dec 28 21:18:12.187: ISAKMP (0:15): vendor ID seems Unity/DPD but bad major*
Dec 28 21:18:12.187: ISAKMP (0:15): vendor ID is NAT-T*
Dec 28 21:18:12.187: ISAKMP (0:15): processing vendor id payload*
Dec 28 21:18:12.187: ISAKMP (0:15): vendor ID seems Unity/DPD but bad major*
Dec 28 21:18:12.187: ISAKMP (0:15): vendor ID is NAT-T*
,Dec 28 21:18:12.187: ISAKMP (0:15): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_MAIN_MODE
Dec 28 21:18:12.187: ISAKMP (0:15): Old State = IKE_R_MM1  New State = IKE_R_MM1*

Dec 28 21:18:12.255: ISAKMP (0:15): constructed NAT-T vendor-03 ID*
Dec 28 21:18:12.255: ISAKMP (0:15): sending packet to 20.1.1.1 my_port*
peer_port 500 (R) MM_SA_SETUP 500
,Dec 28 21:18:12.255: ISAKMP (0:15): Input = IKE_MESG_INTERNAL*
IKE_PROCESS_COMPLETE
Dec 28 21:18:12.255: ISAKMP (0:15): Old State = IKE_R_MM1  New State = IKE_R_MM2*

Dec 28 21:18:12.563: ISAKMP (0:15): received packet from 20.1.1.1 dport*
sport 500 (R) MM_SA_SETUP 500
Dec 28 21:18:12.563: ISAKMP (0:15): Input = IKE_MESG_FROM_PEER, IKE_MM_EXCH*
Dec 28 21:18:12.563: ISAKMP (0:15): Old State = IKE_R_MM2  New State = IKE_R_MM3*

Dec 28 21:18:12.619: ISAKMP (0:15): processing KE payload. message ID = 0*
Dec 28 21:18:12.619: ISAKMP (0:15): processing NONCE payload. message ID = 0*
Dec 28 21:18:12.695: ISAKMP (0:15): SKEYID state generated*
Dec 28 21:18:12.695: ISAKMP (0:15): processing vendor id payload*
```

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                          Dec 28 21:18:12.695: ISAKMP (0:15): vendor ID is Unity*
                          Dec 28 21:18:12.695: ISAKMP (0:15): vendor ID is NAT-T*
                Dec 28 21:18:12.695: ISAKMP (0:15): processing vendor id payload*
                            Dec 28 21:18:12.695: ISAKMP (0:15): vendor ID is DPD*
                          Dec 28 21:18:12.695: ISAKMP (0:15): vendor ID is NAT-T*
                Dec 28 21:18:12.695: ISAKMP (0:15): processing vendor id payload*
                !Dec 28 21:18:12.695: ISAKMP (0:15): speaking to another IOS box*
                            Dec 28 21:18:12.695: ISAKMP:received payload type 17*
                      Dec 28 21:18:12.695: ISAKMP (0:15): Detected NAT-D payload*
                         Dec 28 21:18:12.695: ISAKMP (0:15): NAT match MINE hash*
                            Dec 28 21:18:12.695: ISAKMP:received payload type 17*
                      Dec 28 21:18:12.695: ISAKMP (0:15): Detected NAT-D payload*
                          Dec 28 21:18:12.695: ISAKMP (0:15): NAT match HIS hash*
                  ,Dec 28 21:18:12.695: ISAKMP (0:15): Input = IKE_MESG_INTERNAL*
                                                           IKE_PROCESS_MAIN_MODE
                       Dec 28 21:18:12.695: ISAKMP (0:15): Old State = IKE_R_MM3*
                                                           New State = IKE_R_MM3

                       Dec 28 21:18:12.735: ISAKMP (0:15): constructed HIS NAT-D*
                      Dec 28 21:18:12.735: ISAKMP (0:15): constructed MINE NAT-D*
                  Dec 28 21:18:12.735: ISAKMP (0:15): sending packet to 20.1.1.1*
                                                   (my_port 500 peer_port 500 (R
      ,MM_KEY_EXCH *Dec 28 21:18:12.735: ISAKMP (0:15): Input = IKE_MESG_INTERNAL
                                                            IKE_PROCESS_COMPLETE
Dec 28 21:18:12.735: ISAKMP (0:15): Old State = IKE_R_MM3  New State = IKE_R_MM4*

         Dec 28 21:18:13.395: ISAKMP (0:15): received packet from 20.1.1.1 dport*
                                                   sport 500 (R) MM_KEY_EXCH 500
     Dec 28 21:18:13.395: ISAKMP (0:15): Input = IKE_MESG_FROM_PEER, IKE_MM_EXCH*
Dec 28 21:18:13.395: ISAKMP (0:15): Old State = IKE_R_MM4  New State = IKE_R_MM5*

       Dec 28 21:18:13.435: ISAKMP (0:15): processing ID payload. message ID = 0*
                            Dec 28 21:18:13.435: ISAKMP (15): Process ID payload*
                                                         type         : 2
                                             FQDN name    : 101.cisco.com
                                                        protocol     : 17
                                                         port         : 0
                                                        length       : 13
      Dec 28 21:18:13.435: ISAKMP (0:15): processing SIG payload. message ID = 0*
                             , = Dec 28 21:18:13.435: ISAKMP (15): sa->peer.name*
                                     sa->peer_id.id.id_fqdn.fqdn = 101.cisco.com
                            Dec 28 21:18:13.567: ISAKMP:received payload type 14*
Dec 28 21:18:13.567: ISAKMP (0:15): processing NOTIFY INITIAL_CONTACT protocol 1*
                                      spi 0, message ID = 0, sa = 1AD8D08
                    ,Dec 28 21:18:13.567: ISAKMP (0:15): Process initial contact*
       bring down existing phase 1 and 2 SA's with local 20.1.1.2 remote 20.1.1.1
                                                                 remote port 500
     Dec 28 21:18:13.587: ISAKMP (0:15): SA has been authenticated with 20.1.1.1*
     Dec 28 21:18:13.587: ISAKMP (0:15): IKE_DPD is enabled, initializing timers*
      Dec 28 21:18:13.587: ISAKMP: Locking peer struct 0x18EA370, IKE refcount 2*
                                               for from crypto_ikmp_dpd_ike_init
                  ,Dec 28 21:18:13.587: ISAKMP (0:15): Input = IKE_MESG_INTERNAL*
                                                           IKE_PROCESS_MAIN_MODE
Dec 28 21:18:13.587: ISAKMP (0:15): Old State = IKE_R_MM5  New State = IKE_R_MM5*

                    ...Dec 28 21:18:13.599: IPSEC(key_engine): got a queue event*
    Dec 28 21:18:13.627: ISAKMP (0:15): SA is doing RSA signature authentication*
                                                           using id type ID_FQDN
                                    Dec 28 21:18:13.627: ISAKMP (15): ID payload*
                                                         next-payload : 9
                                                         type         : 2
                                             FQDN name    : 102.cisco.com
                                                        protocol     : 17
                                                         port         : 0
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                                                          length       : 17
                       Dec 28 21:18:13.627: ISAKMP (15): Total payload length: 21*
            Dec 28 21:18:13.627: ISAKMP (0:15): using the default keypair to sign*
           Dec 28 21:18:13.731: ISAKMP (0:15): sending packet to 20.1.1.1 my_port*
                                                 peer_port 500 (R) MM_KEY_EXCH 500
                   ,Dec 28 21:18:13.731: ISAKMP (0:15): Input = IKE_MESG_INTERNAL*
                                                              IKE_PROCESS_COMPLETE
                        Dec 28 21:18:13.731: ISAKMP (0:15): Old State = IKE_R_MM5*
                                                       New State = IKE_P1_COMPLETE

                   ,Dec 28 21:18:13.779: ISAKMP (0:15): Input = IKE_MESG_INTERNAL*
                                                               IKE_PHASE1_COMPLETE
                  Dec 28 21:18:13.779: ISAKMP (0:15): Old State = IKE_P1_COMPLETE*
                                                       New State = IKE_P1_COMPLETE

                Dec 28 21:18:14.215: ISAKMP (0:15): received packet from 20.1.1.1*
                                                   dport 500 sport 500 (R) QM_IDLE
                  Dec 28 21:18:14.215: ISAKMP: set new node 1098460553 to QM_IDLE*
                     .Dec 28 21:18:14.215: ISAKMP (0:15): processing HASH payload*
                                                           message ID = 1098460553
                       .Dec 28 21:18:14.215: ISAKMP (0:15): processing SA payload*
                                                           message ID = 1098460553
                    Dec 28 21:18:14.215: ISAKMP (0:15): Checking IPSec proposal 1*
                                 Dec 28 21:18:14.215: ISAKMP: transform 1, ESP_DES*
                          :Dec 28 21:18:14.215: ISAKMP:   attributes in transform*
                                     Dec 28 21:18:14.215: ISAKMP:      encaps is 2*
                        Dec 28 21:18:14.215: ISAKMP:      SA life type in seconds*
               Dec 28 21:18:14.215: ISAKMP:      SA life duration (basic) of 3600*
                      Dec 28 21:18:14.215: ISAKMP:      SA life type in kilobytes*
   Dec 28 21:18:14.215: ISAKMP:      SA life duration (VPI) of  0x0 0x46 0x50 0x0*
                      Dec 28 21:18:14.215: ISAKMP:      authenticator is HMAC-SHA*
                         .Dec 28 21:18:14.215: ISAKMP (0:15): atts are acceptable*
         ,Dec 28 21:18:14.215: IPSEC(validate_proposal_request): proposal part #1*
                      ,key eng. msg.) INBOUND local= 20.1.1.2, remote= 20.1.1.1)
                          ,(local_proxy= 20.1.1.2/255.255.255.255/47/0 (type=1
                         ,(remote_proxy= 20.1.1.1/255.255.255.255/47/0 (type=1
                               , protocol= ESP, transform= esp-des esp-sha-hmac
                                                           ,lifedur= 0s and 0kb
                                spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x4
                    .Dec 28 21:18:14.215: ISAKMP (0:15): processing NONCE payload*
                                                           message ID = 1098460553
                       .Dec 28 21:18:14.215: ISAKMP (0:15): processing ID payload*
                                                           message ID = 1098460553
                       .Dec 28 21:18:14.215: ISAKMP (0:15): processing ID payload*
                                                           message ID = 1098460553
                 Dec 28 21:18:14.215: ISAKMP (0:15): asking for 1 spis from ipsec*
 ,Dec 28 21:18:14.215: ISAKMP (0:15): Node 1098460553, Input = IKE_MESG_FROM_PEER*
                                                                       IKE_QM_EXCH
                     Dec 28 21:18:14.215: ISAKMP (0:15): Old State = IKE_QM_READY*
                                                     New State = IKE_QM_SPI_STARVE
                     ...Dec 28 21:18:14.235: IPSEC(key_engine): got a queue event*
           Dec 28 21:18:14.235: IPSEC(spi_response): getting spi 488964414 for SA*
                        from 20.1.1.2        to 20.1.1.1        for prot 3
                           (Dec 28 21:18:14.267: ISAKMP: received ke message (2/1*
           Dec 28 21:18:14.547: ISAKMP (0:15): sending packet to 20.1.1.1 my_port*
                                                     peer_port 500 (R) QM_IDLE 500

,Dec 28 21:18:14.547: ISAKMP (0:15): Node 1098460553, Input = IKE_MESG_FROM_IPSEC*
                                                                     IKE_SPI_REPLY
                Dec 28 21:18:14.547: ISAKMP (0:15): Old State = IKE_QM_SPI_STARVE*
                                                          New State = IKE_QM_R_QM2
                Dec 28 21:18:14.707: ISAKMP (0:15): received packet from 20.1.1.1*
                                                   dport 500 sport 500 (R) QM_IDLE
                Dec 28 21:18:14.747: ISAKMP: Locking peer struct 0x18EA370, IPSEC*
```

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refcount 1 for for stuff_ke
Dec 28 21:18:14.747: ISAKMP (0:15): Creating IPSec SAs*
Dec 28 21:18:14.747:         inbound SA from 20.1.1.1 to 20.1.1.2*
(proxy 20.1.1.1 to 20.1.1.2)
Dec 28 21:18:14.747:         has spi 0x1D25013E and conn_id 2000 and flags 4*
Dec 28 21:18:14.747:         lifetime of 3600 seconds*
Dec 28 21:18:14.747:         lifetime of 4608000 kilobytes*
Dec 28 21:18:14.747:         has client flags 0x0*
Dec 28 21:18:14.747:         outbound SA from 20.1.1.2        to 20.1.1.1*
(       proxy 20.1.1.2        to 20.1.1.1)
Dec 28 21:18:14.747:         has spi -1829425422 and conn_id 2001 and flags C*
Dec 28 21:18:14.747:         lifetime of 3600 seconds*
Dec 28 21:18:14.747:         lifetime of 4608000 kilobytes*
Dec 28 21:18:14.747:         has client flags 0x0*
Dec 28 21:18:14.747: ISAKMP (0:15): deleting node 1098460553 error FALSE*
"()reason "quick mode done (await
,Dec 28 21:18:14.747: ISAKMP (0:15): Node 1098460553, Input = IKE_MESG_FROM_PEER*
IKE_QM_EXCH
Dec 28 21:18:14.747: ISAKMP (0:15): Old State = IKE_QM_R_QM2*
New State = IKE_QM_PHASE2_COMPLETE
...Dec 28 21:18:14.767: IPSEC(key_engine): got a queue event*
, :(Dec 28 21:18:14.767: IPSEC(initialize_sas*
,key eng. msg.) INBOUND local= 20.1.1.2, remote= 20.1.1.1)
,(local_proxy= 20.1.1.2/0.0.0.0/47/0 (type=1
,(remote_proxy= 20.1.1.1/0.0.0.0/47/0 (type=1
, protocol= ESP, transform= esp-des esp-sha-hmac
,lifedur= 3600s and 4608000kb
spi= 0x1D25013E(488964414), conn_id= 2000, keysize= 0, flags= 0x4
, :(Dec 28 21:18:14.767: IPSEC(initialize_sas*
,key eng. msg.) OUTBOUND local= 20.1.1.2, remote= 20.1.1.1)
,(local_proxy= 20.1.1.2/0.0.0.0/47/0 (type=1
,(remote_proxy= 20.1.1.1/0.0.0.0/47/0 (type=1
, protocol= ESP, transform= esp-des esp-sha-hmac
,lifedur= 3600s and 4608000kb
spi= 0x92F52EF2(2465541874), conn_id= 2001, keysize= 0, flags= 0xC
Dec 28 21:18:14.767: IPSEC(add mtree): src 20.1.1.2, dest 20.1.1.1, dest_port 0*

,Dec 28 21:18:14.767: IPSEC(create_sa): sa created*
,sa) sa_dest= 20.1.1.2, sa_prot= 50)
,(sa_spi= 0x1D25013E(488964414
sa_trans= esp-des esp-sha-hmac , sa_conn_id= 2000
,Dec 28 21:18:14.767: IPSEC(create_sa): sa created*
,sa) sa_dest= 20.1.1.1, sa_prot= 50)
,(sa_spi= 0x92F52EF2(2465541874
sa_trans= esp-des esp-sha-hmac , sa_conn_id= 2001
```

معلومات ذات صلة

- صفحة دعم IPSec
- الدعم الفني - Cisco Systems

حول هذه الترجمة
ترجمت Cisco هذا المستند باستخدام مجموعة من التقنيات الآلية
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بلغتهم الخاصة. يُرجى ملاحظة أن أفضل ترجمة آلية لن تكون دقيقة كما
هو الحال مع الترجمة الاحترافية التي يقدمها مترجم محترف. تخلي Cisco
Systems مسئوليتها عن دقة هذه الترجمات وتُوصي بالرجوع دائمًا إلى
المستند الإنجليزي الأصلي (الرابط متوفر).